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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,307	11/26/2003	Junghoon Lee	NU22102	6841

7590 09/22/2005

Mr. Edward J. Timmer
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EXAMINER

MACK, COREY D

ART UNIT PAPER NUMBER

2855

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/723,307

Applicant(s)

LEE ET AL.

Examiner

Corey D. Mack

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 18-26 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 17 and 27 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-26 and 28, drawn to apparatus and method of sensing the deflection of a membrane, classified in class 73, subclass 204.26.
 - II. Claim 27, drawn to a method of forming (making) a membrane, classified in class 438, subclass 17.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process (method) and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, Invention I could be practiced by an entirely different method than that claimed in Invention II and vice versa. Therefore, restriction is proper.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
5. During a telephone conversation with Edward J. Timmer on September 14, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 11-

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16, 18-26 and 28. Affirmation of this election must be made by applicant in replying to this Office action. Claims 27 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-16, 19, 21-24 and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Darrow, et al. (US 6,480,730).

A. With respect to Claims 1, 16, 19, 21, 23, 24, 25 and 28, Darrow discloses a sensor comprising a substrate 120 and a flat membrane 126 peripherally connected to the substrate and having a surface where an interaction with a medium, particularly an analyte, occurs in a manner to deflect the membrane relative to the substrate in response to the interaction (column 6, line 28 – column 7, line 27; See Fig. 5).

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B. With respect to Claims 3 and 22, Darrow discloses that the surface has a chemical or biomolecular reaction agent thereon such that a reaction with species of an analyte occurs in a manner to deflect the membrane relative to the substrate (column 2, lines 14-31).

C. With respect to Claim 5, Darrow discloses means 16 for detecting deflection of the membrane relative to the substrate.

D. With respect to Claims 14 and 15, Darrow discloses that the membrane 126 comprises a ceramic material comprising silicon oxide or nitride (column 7, lines 36-56).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 18, 20 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darrow, et al. (US 6,480,730) in view of Beach, et al. (US 6,647,796).

A. With respect to Claim 18, Darrow discloses the claimed invention, except they do not explicitly disclose a gas-containing gap that gas pressurizes the sensor when moved toward the substrate. Beach discloses an actuation area in gas flow communication with the sensor area and having an actuation membrane 20 spaced from the substrate 16 by a gas-containing gap 24 and movable in a manner to gas pressurize the sensor area when the actuation membrane is moved toward the substrate.

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B. With respect to Claims 2, 4 and 12, Darrow discloses that the membrane is elastomeric (polymer) and has a deflectable convex or concave shape (column 6, lines 12-26).

C. With respect to Claim 6, Darrow discloses means for detecting a change in capacitance between electrodes associated with the substrate and the membrane by virtue of the deflection of the membrane 64, 105, 107.

D. With respect to Claim 13, Darrow, as modified by Beach, discloses the claimed invention. Particularly, Beach discloses that the membrane includes one or more metallic layers imparting a convex or concave shape to the membrane before the interaction (column 3, line 44 – column 5, line 4).

E. With respect to Claims 20 and 26, Darrow discloses an actuation membrane 132 being movable toward the substrate to expel gas from the gap by energization of the substrate electrode and the membrane electrode 128.

Allowable Subject Matter

11. Claim 17 is allowed.

12. Claims 7-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13. Applicants' arguments filed 22 June 2005 have been fully considered but they are not persuasive.

A. With respect to claims 1, 19, 21-24 and 25, Applicants argues that the cited prior art fails to teach an "interaction with a medium occurs in a manner to deflect" the membrane; but, instead discloses a "polymer" that reacts with an ionic solution and swells to displace the membrane. However, this polymer would qualify as a "medium" that "interacts" with the surface of the membrane to deflect the membrane. Therefore, the rejection is reasserted.

B. With respect to claims 2, 4 and 13, Applicants argue that the cited prior art fails to disclose metallic membrane having a convex or concave shape before interaction. However, Beach '796 clearly discloses a metallic bowed membrane having convex/concave shape prior to deformation. Therefore, those claims stand rejected.

C. With respect to claim 3, Applicants argue that the cited prior art does not disclose a reaction agent disposed on the membrane. Applicants insist that the Darrow '730 patent discloses a polymer that interacts with the analyte and swells. However, the polymer would qualify as a reaction agent and is situated on the membrane to deflect the membrane when exposed to an analyte. Therefore, the claim stands rejected.

D. Finally, with respect to claims 18, 20 and 26, Applicants argue that Beach discloses a microsensor that senses pressure in a microcavity and fails to disclose that the membrane moves in a manner that gas pressurizes the sensor area or generates a flow of gas. However, these claimed features would be inherent functions of any movement of the membrane, i.e, any

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movable membrane would pressure and create a gas flow as a result of the membrane moving.

Therefore, the claims stand rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey D. Mack whose telephone number is (571) 272-2181. The examiner can normally be reached on M-F, 8:30-4:30.

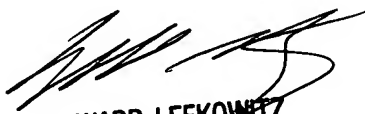
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Corey D. Mack, Esq.
Patent Examiner
Art Unit 2855

September 13, 2005



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